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EDUCATIONAL ASPECTS

OF

MANUAL TRAINING

BY

W. N. HAILMANN,

SUPERINTENDENT OF SCHOOLS, DAYTON, OHIO.

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Educational Aspects of Manual Training.*

Manual training is no longer an experiment. According to Commissioner Harris's Report of 1893–'94, it had been tested at that time in the United States in the public schools of ninety-five cities and towns, in forty-nine institutions of collegiate grade, in nineteen normal schools, and in seventeen special manual training schools. Since it is not compulsory upon institutions to furnish statistics, these numbers fall short of the actual extent of the work. It can be safely stated, however, that wherever this training has been established, it is in a healthy, growing condition, steadily rising in popular appreciation, proving its value as an efficient educational factor, not only in the development of manual skill, but also in the enrichment and invigoration of the intellect, in the direction and strengthening of the will, in the establishment of healthy moral attitude, and in the nurture of public spirit.

It is the testimony of careful observers that the addition of manual training to the curriculum of schools operates as a great time-saving in the so-called purely intellectual studies. This applies with equal force to the kindergarten, the manual training school proper, and the industrial schools, in which children devote only one-half of the day to the ordinary school studies. Dr. Harris reports that the addition of the kindergarten to the public schools of St. Louis represents a saving of more than a year of ordinary schooling to each child concerned. Similar testimony comes from Philadelphia, Milwaukee, and a dozen other cities. Dr. MacAlister testifies that in the Philadelphia manual training school, students learn in the three years' course of the institution as much of history, English and literature, German, and bookkeeping as others do in other parallel high school courses; and a great deal more of science and mathematics, including geology, physics, chemistry, physiology, mechanics, steam engineering, applied electricity, geometry, algebra, and trigonometry; in addition to drawing, designing, and modeling, and the regular courses in joinery, pattern-making, wood-turning, wood-carving, modeling, forging, soldering, molding and casting, vise-work, and mechanical construction.

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*Address delivered before the Present Day Club, of Dayton, O.

Such results seem almost incredible to one unfamiliar with the laws of mental development, or to a mind whose powers of perception in this direction have become clouded by the misty scholastic medievalism of the traditional school. In the light of modern psychology and child-study, however, the solution of the matter offers no serious difficulties.

A most interesting observation came to me during my administration of the Indian schools of the nation. These schools are not establishments for the mere acquisition of the three-R accomplishments of the ordinary public school. They are meant to be all-sided, civilizing agencies for the uncivilized red children of plain and forest. They are to these children not only school, but also home and community and, in a measure, even church, or, at least, Sunday-school. They touch every phase of life. Consequently, their character is, to a large extent, domestic and industrial. Girls are taught the arts of home-making, and boys the arts of community-making. For this reason only three hours a day can be devoted to school-room work. The remainder is given to the domestic and industrial interests of the institution, cooking, sewing, laundering, nursing the sick, care of rooms, etc., on the part of the girls; to farming, care of stock, tailoring, shoemaking, carpentering, blacksmithing, and other indispensable shop-work, on the part of the boys.

This would naturally lead to the inference that the progress of the children in the three-R studies must be unsatisfactory. The inference would be further strengthened by the consideration that these children do not speak English on entering the school; that in previous home environment, mode of life, hereditary tendencies, in mental power and drift, the Indian child is inferior to the white man's child or very different from it. Yet, in spite of these drawbacks, the Indian children make in their studies marked progress. They accomplish in eight years about as much in these studies as our children do in six years of whole-day school life. If, subsequently, they enter some of the advanced non-reservation schools where the same general system prevails, they can be graduated at the age of eighteen with as fair an equipment of scholastic attainments, with the exception of Latin and German, as white children take from the second-year class of an ordinary high school. In addition, the girls are good housekeepers, cooks, laundresses, seamstresses, and nurses; the boys acceptable farmers, fairly skilful carpenters, blacksmiths, shoemakers, or tailors.

I can find for this no other explanation than the fact that in these schools head, heart, and hand are harmoniously trained; that every life-interest of the children is intelligently respected and nurtured at all times and in all places; that, consequently, interest on the children's part never flags; that the children work with an intelligent purpose which they can appreciate; that the sense of power and the sense of duty are kept alive by the atmosphere of valid responsibility and efficient doing which pervades every department of these institutions. And it is this condition which full-fledged manual-training would bring about in our schools.

Educational and Economic Value.

A distinction is made between the educational and the economic value of manual training. To me this distinction is fictitious. If there is educational value in manual training, this will be realized most obviously in its reaction on economic relations; and if there is economic value, education should, for this reason if for no other, consider it in its systems, methods, and plans of work. It is conceded that, in so far at least as the community is interested in educational institutions, it has a right to demand that the school prepare its pupils for efficient citizenship. And surely, if this implies anything, it implies active and effective participation in the economic life of the community. Efficient morality, efficient intelligence, as well as efficient manual skill are thinkable only in effective relationship with the economic life of the community, and vice versa.

Indeed, the unanswerable arguments against the traditional school all rest upon the fact that it is out of harmony with the economic life of our time. The economic life of our time demands a degree of intelligence and morality for which we can no longer rely on chance or narrow empiricism, for which we need careful training; and this we have a right to ask of the school.

That the traditional school fails of its duty in this respect appears on the surface. Its curriculum is limited to subjects which are, indeed, necessary in a scheme of general education, but which have no direct bearing upon the practical needs of life in a modern community of workers.

The truth of this fact is presented in some interesting statistics which we owe to Mr. Hodge, the efficient secretary of the international committee of the Y. M. C. A. He says:

"Of 13,000,000 young men in the United States between the ages of 16 and 35, only 5 in every 100 have been prepared by education received at some kind of a school for their occupations; 95 have not been so prepared (1895). From a study of the subject, ascertaining the previous training of bodies of men engaged in different industries and manufactures; also following our graduates of colleges, universities, and professional schools into their daily vocations, it is found that of every 100 graduates of our grammar schools, only 8 obtain their livelihood by means of the professions and commercial business, while the remaining 92 obtain the same by means of their hands. The 8 are fitted for their wage earning capacities by the training obtained in colleges, universities, and professional schools, while the 92, denied similar opportunities, are obliged in the great majority of cases and amid great embarrassments to fight their way for a livelihood by experiment and imitation of other workmen."

It is interesting to note that these statistics take no account of Carlyle's "One monster in the world, the idle man." I saw this monster in his glory two years ago at Yuma. Daily for two weeks, I had an opportunity to observe him in the shape of a little army of white tramps, waylaying the passengers on the Great Southern Road, begging for "something to buy a meal." I talked with him and found that he could read and write, that in many instances he had attended high schools and that in a few instances he held a college diploma. I was deeply impressed with the fact that the Indians from the reservation just across the river did not form part of him. They sold curiosities to the passengers who might ask for them, or went in search of a variety of manual chores in the town, but never begged. The monster held this Indian in the traditional white man's contempt; but I became convinced that there are others who would be improved and would improve the world even more than the Indian by consenting to be dead.

Physical and Psychical Life a Unit.

Modern psychology has recognized a strangely intimate relation between physical and psychical life. It has shown that in earthly existence the full life of each is conditioned by the other. Neglect of the one is sure to result in neglect of the other. Excessive indulgence or exclusive activity of the one reacts unfavorably upon both mind and body. Similarly, rational attention to head and hand in their fundamental mutual relations proves beneficial in the development of both.

Stimulus comes to the mind only thru the mediation of the senses, which are physical. Mental expression is possible only thru the mediation of tongue and hand, both of which represent physical activities. Thus there seems to be more than poetical truth in Milton's saying that "The whole man is soul, and the soul man," and more than mystic dreaming in Swedenborg's prophecy that the angels "discover man's autobiography in his structure."

To modern psychology man is a living, energetic soul, whose very essence is self-activity which becomes manifest to itself and to its world by a variety of actions, inward and outward, culminating respectively in insight and conduct. In these actions, mind and body, head and heart and hand, the intellect, the emotions and the will, have an equal share. Over all rules the free self-active will; and all these other things represent but steps or modes by which the self-active will rises to the conscious control of itself and its world. Thus modern psychology is rapidly doing away with the crude notions of earlier days. The unseemly rivalries are steadily yielding to a better and stronger conception of man, in which all these things appear as phases or stages in the life of the soul of man.

Older metaphysics contended for an intrinsic antagonism between thought and feeling, holding that the two exclude each other. To modern psychology, both lie in the same conscious act. As light and heat are born on the same ray, so thought and feeling are born at the same moment, when the first impression becomes the first sensation. Thought is the light; feeling the warmth. Thought beholds, and feeling rejoices or turns aside. The true, the beautiful, the good—in so far as we are concerned—owe their value to feeling. For thought, truth and error, good and evil, beauty and its opposite are equally attractive; feeling alone can turn them into life or keep them out of it. Thought makes us wealthy, feeling makes us rich. Yet without the wealth of thought, feeling could not raise us from poverty. Without thought, feeling is blind; without feeling, thought is dead. Thus the two do not exclude, but supplement each other. Thought finds what feeling seeks. Feeling holds fast what thought seizes. Both are one in efficient life.

Yet these two, thought and feeling, are unthinkable without the hand. The hand first taught man to separate himself in thought and feeling from his environment, to find himself, as it were, and to make the world *his* world. The hand first taught him to distinguish in thought and feeling between the inner and the outer, between the psychical and the physical, between his soul and his body. In short, it is the hand that enables man to feel and teaches him to think.

In this connection, it is interesting to note that the Latin *manus* for *hand* and the English *man* are derived from practically the same Aryan root *ma,* which in the case of *manus* means the *measurer* and in the case of *man,* the thinker. The significance of this becomes apparent when we consider that thinking is a mental measuring, just as measuring is a manual thinking.

Manual Activity Essential to Intellectual Development.

Manual activity is essential to mental development, both inward and outward. As the seat of the sense of touch and of the more delicate phases of the muscular sense, the hand is man's principal dependence in the exploration of his objective world, in discovery and experiment.

It is equally essential in the arrangement and modification, in the subjection and control of his environment with reference to individual and social requirements of existence and comfort.

It is indispensable in the work of self-expression, on which rests every step in the upward and outward development of man and in the onward evolution of the race. Every phase of the mental and spiritual emancipation of man from the thraldom of material necessity, from the inertias of heredity and from the tyranny of animalism depends in its ultimate realization on effective manual doing.

For this we need no clearer proof than the origin of language, that wonderful engine of thought and mental achievement. Comparative philology shows beyond a doubt that in its primitive roots, language rests on manual activity, on simplest doing with the hands unaided even by tools, on combinations of sounds symbolizing such acts as rubbing, scratching, digging with the hands, boring, holding, and the like.

You all remember the marvelous history of the Sanskrit root *mar* laid bare by Max Mueller. To this root, which originally meant rubbing between the fingers, he refers the Latin *molo* and the German *malen*, to grind; the German *mahlen*, meaning to paint; the *molar* teeth; the Latin *mollis*, soft; the Greek *melas*, black; and consequently our *melancholy;* the French *marteau*, the hammer, and our own *mortar* and *mill; Mars*, the god of war, and *mors*, death, both relentless grinders of *mortal* men; *mare*, the sea, grinding the shore; *marsh, murder, mellow, meal, morbid*, night*mare* and many others.

Other equally significant lists might be adduced. I confine myself to but one more. From a Sanskrit root *skar*, meaning originally to scratch with the finger nail, we have such words as *scar, scratch, share, shear, sheer, shire, shore, scarce, score, scrip, scribble*, the Latin *scribo*, the German *schreiben* and the French *écrire*, all meaning to write; scarf, shred, and a host of others.

Even the highest words in human speech are so derived. *Speech* itself points back to a root meaning to *rattle; literature* to the act of *smearing; thought* to a *putting* or *fitting together; soul* to the act of *stirring* or *tossing about;* and the very *heavens* to the act of *bending*.

Fundamentality of Work.

Two organs, tongue and hand, are given to man, by which he may make his thought manifest. By what he says and does, his hopes and purposes, his aspirations and ideals, his inner possibilities, become outer realities. In work and speech, whatever there is in man of thought and purpose is revealed to himself and to his fellows in the measure of *his* skill and *their* power of appreciation, and this latter, in its turn, depends upon *their* measure of skill.

Thus, thinking, speaking, and doing—thought, speech, and work—are in their origin and development indissolubly interconnected. They are to each other somewhat in the relation of body and mind, essentially one—inseparable phases of the one conscious soul-life of man. The one is unthinkable without the other. Neglect or deterioration of the one is sure to bring about the deterioration or decay of the other.

In their interrelations, however, work appears pre-eminently as a social, thought as an individual, activity, and language as the mediating link between the two. Thru language, the thought of the individual learns to make itself one with the thought of a social group in work which is invariably related to some common social interest.

From these considerations it appears that manual training as an educational factor has deeper roots than the transient industrial needs of our time. These roots lie in the imminent nature of man, in the demand for his full, all-sided development in individual and social relations. In this sense, manual training is as much a need of the professional and literary man, of the merchant and clerk, of the capitalist and landowner, as it is for the artist and artisan, the laborer and farmer.

Indeed, among the high and holy thing of life, work is, perhaps, the highest. Without it the remaining phases of soul-life, thought and speech, have no meaning or reason for being. The very essence of work is creativeness, the imposing of the law of the worker upon his environment.

Moreover, work imparts somewhat of its own character to all it touches. It projects into the material things of this world the creative spirit which is its soul, spiritualizes them, as it were, imparts to them value on a higher plane of being.

Behold a lump of hideous coal, and note the wonderful transformations it undergoes in the hands of work. Note how beneath the magic touch of work, the shapeless block of marble shines forth the living embodiment of some deep yearning, some high ideal of beauty, a Galatea charmed into life to crown her maker's love.

Work conquers the world for man, compels it to serve the spirit that dwells within him, makes it one with him. Without work, language and thought, brotherly love and the spiritual development of man are unthinkable. War and strife, human wretchedness and crime, ignorance and selfish greed have no keener foe than work. The very Savior of man is the carpenter's son.

It is true that in the trinity of full-life, thought and speech are indispensable, that work can not live alone. Yet work represents the ultimate of this trinity, that by which life endures and compels all other life to serve its law.

The Hand, Man's Projected Brain.

The typical organ of work is the hand, the projected will, man's outer brain, as it has been aptly called. In very young children, every dawning sensation leads outward in some sort of muscular movement, wholly meaningless at first, merely announcing in a vague fashion that something is striving for utterance. Subsequently, these muscular reactions become more and more definite, and appeal more and more exclusively to the hand, as the chief organ of expression. Whatever interests the child he seeks to grasp with his hands. With all things he seeks manual contact, in exploring or representing activities.

Indeed, the thought-expression of language never can fully replace that of the hand. Language is diffusive. In itself it is incomplete. Unless it sets to work some hand, it loses its purpose. The thought-expression of the hand, on the contrary, fixes and renders permanent the thought it expresses. It translates into objective, observable reality the groping uncertainties of thought and removes from these all doubt and awkwardness.

In proof of this we need but follow the development of some idea in the mind of a child, *e. g.*, the idea of a cube. The child will obtain very vague impressions of the cube from merely seeing it; and these impressions will be confined, in so far as its shape is concerned, to considerations of only two dimensions. The third dimension will be revealed to the child only by the handling of the cubical object; and the full idea of the cube will enter the thought-life of the child only thru play—the work of the child—in which the cubical object is used and controlled in manual activity either by himself or his playmates. By using a variety of cubes, the idea is freed from accidents of size, color, etc. Yet nothing will free the idea from inaccuracies and insufficiencies of conception as effectively as the making of cubes, the manual representation of the idea, in clay, sand, paper, or other plastic material, and its use in work in which it plays a part. At every step of such manual representation of its idea of the cube, the child has opportunity and constant invitation to compare his representation of the idea with his idea, and with the thing from which his idea is derived.

These considerations apply with equal force to the growth of every other idea. Sense-perception can be lifted into ideas only with the aid of manual activity in work. Indeed, the hand is ever a most profitable servant. It pays him whom it serves. It not only performs the required tasks by gathering increased stores of skill, but it brings at the same time to its master new information, increased clearness and power of thought, increased directness and scope of will. It seems as if the joy of work were the only reward it claims; and great, indeed, is the joy the hand brings to him who follows it into the realms of subtle mechanical skill, of patient scientific re-research, or to the heights of art.

The Pleasure and Value of Learning by Doing.

Who does not remember how much he is indebted for his mental development to the busy hands of childhood; what progress he made in hydraulics with the help of waterwheels he whittled from stray shingles and set to work in the brook; how he gathered ideas of the buoyancy of air and water from his boat and kite; what knowledge he acquired of the materials used, of forms and numbers involved; how successfully he studied geometry upon cookies, slices of apples, bits of clay or dough; or how, in idle moments, his mind, feeding upon the income of busy hours, practiced the art of pondering his acquirements in the imagination, the art of freeing them from the dross of materialness, of culling from his past achievements aspirations for higher ones, forming purpose, devising plans, inventing contrivances for their realization.

It appears that the efforts of the mind to control and guide the hand in these matters are repaid an hundred-fold, not only in clearer insight into all the details of form and composition, of properties and relationships of the materials used and of the objects turned out, but also in nobler aspirations, higher hopes, greater firmness of purpose, calmer self-reliance and a nearer approach to all-sided freedom. And it appears, too, that these things can come to man only thru the activity of the hand in work and play.

The traditional school, that has not yet been touched by the common sense and common goodness, by the deeper insight and higher purpose of the kindergarten, puts an end to this full-life in the development of the child. It seals more or less hermetically the sources of the vitalizing stream that was meant to feed the child's soul with fresh, sparkling waters of personal experience and personal purpose. It dams the mouth of the stream which in its outward flow was meant to lead the child's life into the life of his community and, thru this, into the life of his race. And then,—it dribbles into the captive soul in measured drops the stale waters of a spiritless conventionalism, of a distant past and of far-away environments, inaccessible except by paths hewn out by personal experience.

What wonder if the children learn little, and this little so slowly and painfully. What wonder if what they do learn lacks the warmth of life and is of little value to them in the concerns of practical life.

This is the situation which the so-called new education would change. It would keep the sources of fresh, inflowing experience open and bring in new tributaries. It would widen and deepen the mouths of the child's individual life-stream and lead it into the mightier current of true citizenship, an effective and efficient contribution to its beneficent flood.

Adaptation to Environment.

The business of life is adaptation to environment, to nature, to the universe. This implies knowledge and control of self and surroundings. The business of education is to lead the child to these things on the shortest and surest road and with the greatest possible economy of effort. The child should learn to rely implicitly upon its power to see, say, and do. It should acquire in these matters the habit of success, a calm sense of power, a firm conviction of mastership.

This is possible only if head and hand have been trained simultaneously and in unison with one another; and for this manual training is indispensable.

This manual training in scope and method, however, is broader and goes deeper than mere industrial training. It does not add new burdens to the school; it removes burdens. It enables the child to gain the knowledge represented in current subjects of instruction in a manner suited to his tastes, interests, and powers; to live himself, as it were, into this knowledge in an active, ideal, efficient child-life in which he is upheld by the constant joy of success, the steady glow of the sense of growing power and usefulness.

Such manual training is found in the genuine kindergarten. It is found in the modern elementary school, in which the principles and work materials of the kindergarten and certain forms of sloyd have gained entrance. It teaches number and form ideas by enabling the child to handle, as well as to see, numbers of things of various typical forms; by affording him opportunity, as he progresses, to use these ideas in suitable representative and constructive work with plastic materials and in drawing. It leads him to use skill and knowledge, so acquired, in his geographical, historical, literary, and scientific studies, in such a way that facts and relations, principles and formulas, become his living possession thru rational doing, thru their eager application in interesting creative work, rather than as a residue of tedious verbal repetition.

Knowledge, gained thus and used thus for some living purpose, is never forgotten. It is directly applicable to the requirements of practical life. It prepares for efficiency in life *out of* school and *after* school, by the very atmosphere and habit of efficiency it establishes *in* school. It is practical—eternally so—at every point.

Such manual training prepares the child most satisfactorily for any subsequent work in the various departments of advanced education. Whether he enter the classical or the scientific, the commercial, or the technical department of the high school, he will carry there with him the habits of patient research, of rational thinking, of solid judgment, of creative fervor, of mobile skill, and calm self-reliance—in short, of all-sided efficiency, which no other training can give him. And by these alone can he climb to mastership in life.

Some Manual Training Results.

Because of the mass of detail involved, it is impossible here to enter into particulars of the character and make-up of the manual training school proper in connection with upper grades of grammar schools or, better still, as distinct departments of high schools. I must be content with the statement that such schools or departments, in their best forms, lead towards every kind of industrial activity, to plastic and pictorial art, as well as to the scientific laboratory which is to-day so closely related to both the material and spiritual elevation of man.

It is evident that such manual training schools and technical departments constitute a fit culmination of a rational head-heart-and-hand training in the direction of the mechanic arts, engineering, and mining, and other worthy human pursuits that are unthinkable without manual skill. In addition to an artist here and there, in addition to an occasional Stephenson or Edison, it will pour forth numbers of intelligent, broad-minded, large-hearted captains of industry who are primarily citizens in harmony with the best and highest culture of the day,

—captains, lieutenants, and sergeants of industry, who see and feel the bearing of their work upon the public good, and realize their responsibility in this direction.

It is evident, too, that such schools and departments stand as high in the scale of scholastic dignity in the light of modern ideals of life, and that they satisfy at least as urgent a need in the institutional development of the nation as the classical, the literary, and the commercial departments.

Outline for the Several Grades.

In rough outline, the following will indicate the possibilities of a continuous, rational scheme of manual training in the service of general, harmonious education.

1. The kindergarten has its well-known means of all-sided manual occupations for the guidance of experience and discovery, the training of the imagination and thought, the sensibilities and the will, as well as for inventive and productive work. It is needless to enumerate these here.

2. The primary school, in gaining clearness and control of number and form ideas, uses beads, sticks, and blocks in arranging and constructing activities. Paper-folding and cutting aid it in analytic and synthetic work, leading to the establishment of purpose and liberating the esthetic sense in constructive designing. Clay, cardboard, and other plastic material, together with suitable tools for measuring and fashioning, afford ample means for the formulation and expression of thought and purpose connected with the observation and study of the things of nature and art. Drawing, modeling, and coloring stimulate artistic invention and serve as a basis for vivid language expression, more particularly in connection with geography, history, and nature study.

3. The grammar school, in its earlier stages, uses cardboard, wire, soft-wood, etc., in form study and geometrical construction, in the preparation of various articles of use in the work of the school for purposes of illustration, as well as in the experimental study of the forces of nature and of their simpler applications in the industrial and mechanic arts, and of the part they play in wind and weather. Drawing, modeling, and coloring continue to serve purposes already indicated. In addition, in a simple course of sloyd, the pupils learn to use the knife, the hammer, the saw, and the plane, with accuracy and dispatch in the construction of simple articles of use and ornament for home and school.

4. In its later stages, the grammar school continues and extends its course of drawing, modeling, and coloring in illustrative work connected with various subjects of instruction as well as in systematic efforts to lead the pupils to skill and power in the practices of conventional art. It extends and systematizes the laboratory work in the study of natural forces, and introduces the pupils to the conventional arts of the workshop in a special manual training department, where they are taught the elements of drafting, joinery, wood-turning, wood-carving, and the like.

5. This work is followed in the high school by systematic courses of laboratory work in connection with the studies of natural science ; in drawing, modeling, color-work, etc., in accordance with the recognized rules and requirements of conventional art ; in mechanical and architectural drawing ; in the use of tools and machinery in working wood and metals, and in the arts of engineering.

Objections Met.

The chief objections brought by traditionalists against the introduction of such work, are the lack of time and expense. The school, they say, is already over-burdened with subjects of instruction.

The futility of this objection will become apparent, when we consider that the manifest over-burdening of the school is due, not to the subjects of instruction, but to prevalent artificial and lifeless methods of instruction which fail to appeal to the pupil's natural interests, overload his memory at the expense of his judgment, and, by dwarfing his powers of self-expression, lead him to indolence and inefficiency.

Its fallacy will become still more obvious when it is remembered that, at least until the later stages of the grammar department are reached, the proposed manual training does not enter as a new subject of instruction, but simply does away with the artificialness, lifelessness, and inadequacy of the traditional methods, respecting the pupil's natural interests, cultivating his judgment, affording him ample means for self-expression, giving him a keen sense of his powers and responsibilities, and thus revealing to him the supreme joys of industry and all-sided efficiency.

We shall then appreciate the cogency of the universal testimony that such manual training, wherever it has been seriously established, far from adding burdens to the school, relieves of burdens, reduces failures to a minimum, saves time, intensifies thoroness, and raises towards its maximum the spiritually and materially practical value of the school.

With this also the second objection as to expense falls to the ground. For, even if the yearly expense per pupil should be increased—which is denied by those who have made the experiment—the saving in years to the pupil and to the state, the greater gain and the greater value of the gain to the pupil and to the community, would vindicate the wise economy of the added expense.

As to the value of special departments of manual and technical training in connection with the upper grammar grades and the high school, ample justification will be found in the increasingly industrial character of our time, in the steady drift towards specialization, and in the need for broad-minded and large-hearted leadership in the industries. Culture, which at one time was needed only for the liberal professions and for the purposes of refined leisure, has become a need of men and women in every walk of life, and the more so in a land in which every citizen claims an equal share in the direction of public affairs and in the enjoyment of general prosperity.

Harmony in Social Organism.

Society, in a larger way, is organized very much on the pattern of individual man. It has its head-heart-and-hand needs, its head-heart-and-hand members. One becomes its explorer, its gatherer of experience, its seeker after facts; another is its thinker; still another voices its deepest sentiments of joy, hope, and aspiration; in one strong soul is centered its will; others devise ways and means for the realization of this will; and many are needed to carry out its behests in earnest, active, devoted doing. And who will say which of these is most needed, which of these could be spared in the full-life of the social organism, without lowering its tone or entailing its decay?

Now, as in the fully developed individual man head-heart, and hand sing in conscious harmony, so a social or, ganism reaches full life in the measure in which its various interests are harmonized in the conscious life of the individual members that represent these interests.

This is recognized by the rational education of our day. In its earlier work, in kindergarten and primary school, it addresses itself with equal insistence to the various life-utterances of the child. It has ever in view the whole being of the child. It trains the intellect, the sensibilities, the will, and the hand; teaches him to see, say, choose, and do. It does this, perhaps at first, chiefly with reference to individual aims; but it directs these steadily more and more into social channels.

Later on, in more advanced departments of instruction, it differentiates more and more distinctly, follows inclination and aptitude, develops talent, and matures genius. Yet it guards against one-sidedness, makes art, which needs the hand, an element of classical culture, couples science with the laboratory, makes the essentials of all of these an important element in manual and technical training.

Thus, in each of these departments, pupils and students learn to sympathize consciously with all other departments, learn to appreciate intelligently the vital relations which, in the larger life of society and of humanity, make them interdependent and one, learn to realize their own powers and responsibilities with reference to the welfare of the whole—burning with the desire for self-expansion—and to make of themselves conscious factors in the progress of the community and of mankind as a whole·

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